United States Environmental Protection Agency

Tier 2 Study Workshop

April 23, 1997

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Workshop Overview

- EPA Presentation
  - Study overview
  - Air quality need
  - Technology Assessment
  - Cost Effectiveness Assessment
- Non-EPA Presentations
- Question and Answer Session
- Wrap-up

Workshop Format

- Informal!
- Ask clarifying questions following presentation
- ★ **Goal is to obtain input to help set priorities and develop work plans:**
  - **Input on scope**
  - **Perspective on issues**

Tier 2 Team

- Team Lead: Jim Markey
- Air Quality Need: Rob French, Tandi Bagian
- Technology Assessment: John German, Peter Hutchins, Sonny Kakar
- Cost-effectiveness Assessment: Jim Markey, Sue Willis, Karl Simon

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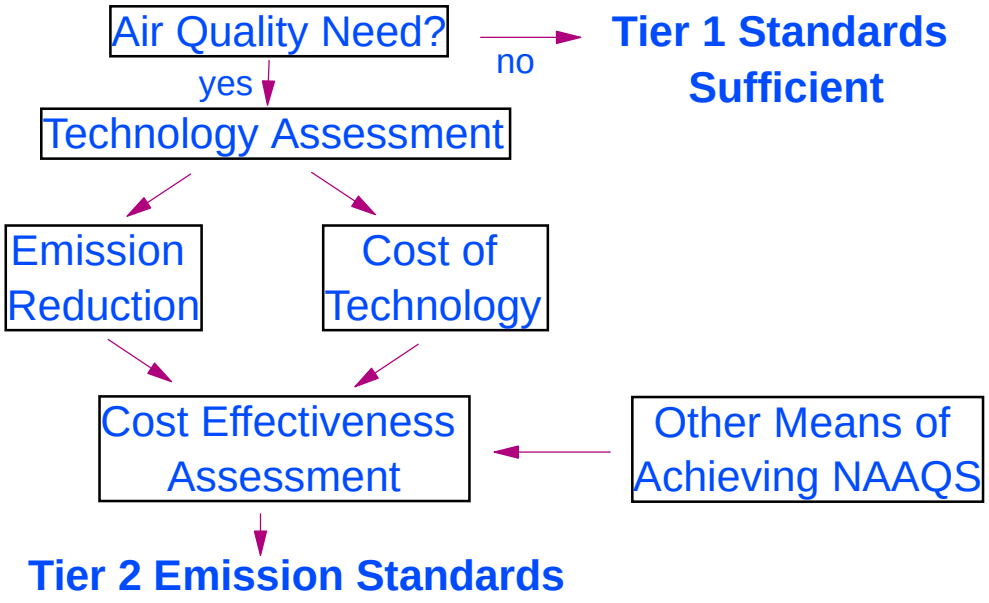
Tier 2 Study Elements



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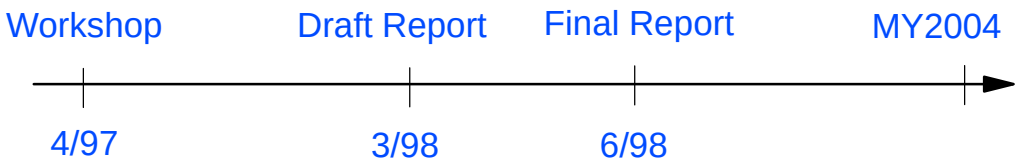
Timeline



- Comment period following draft report
- Final report includes summary of comments
- MY2004 is earliest date for Tier 2 standards

Air Quality Assessment

EPA "...shall examine the need for further reductions in emissions in order to attain or maintain the national ambient air quality standards..."

-- Clean Air Act Sec. 202(i)(2)(A)

Conceptual Approach

1. Determine the geographic areas which fail to meet the National Ambient Air Quality Standards (NAAQS)

2. Establish emission reductions needed to bring these areas into attainment

3. Use emission inventory data on sources of emissions to establish source-specific emission reduction targets

Integration

- OMS will utilize existing air quality assessments
- Coordination with:
  - Ozone Transport Assessment Group (OTAG)
  - FACA Subcommittee on Ozone, Particulate Matter, and Regional Haze
  - EPA Cold CO Study and other studies

Issue: Choice of Criteria Pollutants

- Ozone NAAQS (ozone precursors, VOC and NOx)
- CO NAAQS (CO emissions)
- PM NAAQS (particulate matter)
- ★ **Clean Air Act not specific; EPA interpretation is to look at NAAQS related to motor vehicle emissions**

Issue:
Time Frame for Evaluating Need

- Considerations:
  - Analyses for proposed NAAQS revisions used 2007
  - Earliest possible implementation of Tier 2 standards is 2004 model year
  - Full impact of Tier 2 standards not realized for 12-15 years due to fleet turnover.

★ **For what year(s) should EPA assess air quality need?**

Issue:
CO Assessment

- Air quality with respect to CO has been improving recently

★ **Are there specific CO issues that EPA should be considering?**

Issue:
PM Assessment & Inventory

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- Recent modeling suggests cars and light trucks are not large contributors to PM inventory

★ **Is there more data and information on PM emissions from cars and light trucks, regarding both current and potential future impacts?**

Issue:
Secondary Particulate Formation

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- SOx and NOx emissions produce secondary formation of particulate in the atmosphere

★ **Are there more data/information on the relative importance of secondary PM emissions from cars and light trucks?**

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Technology Assessment

EPA shall examine "the availability of technology (including the costs thereof), ... for meeting more stringent emission standards....., including the lead time and safety and energy impacts of meeting more stringent emission standards."

-- Clean Air Act Sec. 202(i)(2)(A)(i)

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Framework

- Assess the availability of cost-effective technology to assist in meeting air quality needs
- Address both benefits and costs of technology

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Issue: Baseline Assessment

- NLEV (CA-LEV) stringency is the assumed starting point
- NLEV is more stringent than the default Tier 2 standards for NMHC, but less stringent for NOx and CO

- ★ **Is NLEV the appropriate starting point for the Tier 2 Study**
- ★ **Seeking data (including SFTP tests) on LEVs and ULEVs**

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Issue:
NMHC versus NOx Control

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- EPA will use:
  - OTAG air quality modeling work and recommendations
  - NAAQS revisions modeling work
- NMHC and NOx ozone benefit estimates will be combined with control cost estimates to establish the appropriate level of NOx and NMHC emission reductions

★ **Is this the appropriate approach for setting NOx and NMHC standards?**

Issue:
Costs and Emission Benefits

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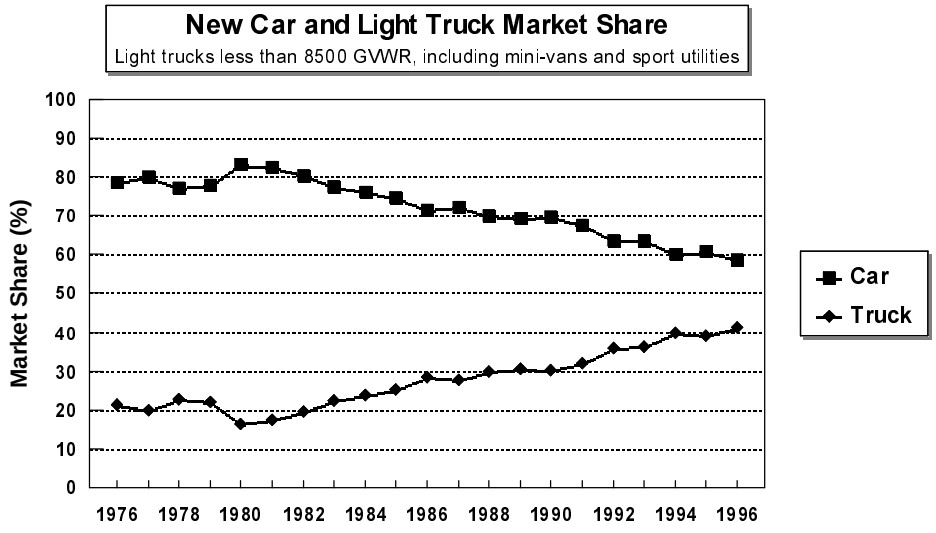
- LEV program provides actual cost and emission benefit data for comparing LEV and Tier 1 technologies
- EPA will independently assess potential technologies for achieving emission levels different from LEV standards

★ **Data and information on the potential emission reductions and costs of any emission control technology are solicited**

Issue: Light Truck Standards

- Neither the suggested Tier 2 standards or the NLEV program increase Tier 1 stringency for trucks over 6,000 GVWR
- LEV standards for trucks over 3,750 curb weight are substantially less stringent
- Due to steadily rising sales, light trucks are likely to account for over 50% of VMT and 60-75% of light duty NOx emissions in 2010

Issue: Light Truck Standards cont'



Issue:
Light Truck Standards cont'

- EPA will assess whether or not to reduce the difference in the stringency of the emission standards between passenger cars and the various LDT classes.

★ **What are the feasible emission levels and associated costs for each truck class relative to car standards?**

Issue: Harmonization

- Both CARB and the European Community are considering NOx standards considerably more stringent than NLEV NOx levels in the 2005-2010 time frame

★ **What are the pros and cons of harmonizing Tier 2 emission stringency with CARB and/or the European Community?**

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Issue: Heavy-Duty Vehicles

- Trucks over 8,500 GVWR are classified as heavy-duty and are subject to less stringent engine-based emission standards
- Many of these trucks are used like light-duty trucks; sales of such trucks are steadily increasing, especially diesel engine sales

★ **EPA does not intend to address this issue in Tier 2 study; heavy-duty gasoline and diesel requirements will be reevaluated in a separate rulemaking**

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Issue: Certification Fuel Specifications

- Preliminary data on LEV vehicles indicate their emissions may be very sensitive to fuel composition, especially sulfur levels
- The standardized test fuel used for determining compliance with light-duty exhaust emission standards has very low sulfur levels and a relatively simple hydrocarbon composition

★ **What is the need, desirability, and cost of using representative in-use fuels for compliance purposes?**

Issue: Diesel Engine NOx Exemption

- Diesel engines in cars and trucks under 6000 GVWR are subject to less stringent NOx standards than gasoline engines
- The CAAA specifically removes the diesel NOx waiver after MY2003 and requires EPA to consider emission levels for both gasoline and diesel engines

Issue: Diesel Engine NOx Exemption cont'

- **What is the intent of Congress?**
- **Should diesel engines be subject to the same NOx standards as gasoline engines?**
- **What is the cost of requiring diesels to meet the same standards as gasoline engines?**
- **What is the air quality impact of a diesel engine NOx waiver?**

Issue: Particulate Emissions

- Recent health studies suggest that small particulate are a major health hazard
- Current particulate standards are specifically designed for diesel engines
- The gasoline engine generates much lower particulate levels

Issue: Particulate Emissions cont'

- **Given that gasoline vehicles are driven over 2 trillion miles a year, is there a need to reassess gasoline particulate emissions?**
- ★ **Should diesel engines continue to have less stringent particulate standards?**
- ★ **What are the potential costs and benefits of setting particulate standards at gasoline emission levels?**

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Issue: SFTP Standards

- In addition to FTP standards, the technology assessment must consider:
  - SFTP standards
  - the need for SFTP particulate standards

★ **Data and information on how to set SFTP standards are solicited**

★ **What is the need for and appropriate level of particulate standards for the SFTP?**

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Issue: Alternative Fuel Vehicles

- Should EPA set fuel-neutral standards (i.e., all vehicles on all fuels should meet the same standards) or set standards specifically for different types of fuel?

★ **Are fuel-neutral standards appropriate?**

★ **Data and information on appropriate adjustments for FTP and SFTP standards for alternative-fuel vehicles are solicited**

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Issue: Evaporative Emissions

- The CAAA requirements for the Tier 2 Study did not address evaporative emissions
- EPA has acted to reduce evaporative emissions from light-duty cars and trucks
- ★ **Should evaporative emissions be included in the Tier 2 Study?**
- ★ **If so, what aspects of the evaporative emission requirements should be addressed?**
- ★ **Should EPA consider an exhaust plus evaporative emission NMHC standard?**

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Issue: Durability/Useful Life

- The CAAA requires EPA to consider, "other standards and useful life periods which are more stringent or less stringent..."
- EPA will assess the emission benefit and cost tradeoffs between useful life requirements and emission standard levels
- ★ **What are the costs and benefits of extending the useful life requirements and/or extending the limitation on in-use testing, relative to more stringent emission standards?**

Cost-effectiveness Assessment

EPA is to examine "the need for, and cost effectiveness of, obtaining further reductions in emissions...taking into consideration alternative means of attaining or maintaining the national primary ambient air quality standards pursuant to State implementation plans and other requirements of this Act, including their feasibility and cost effectiveness."

-- Clean Air Act Sec. 202(i)(2)(A)(ii)

Framework

- Compare cost-effectiveness of Tier 2 standards to alternative means of obtaining reductions
- Build on efforts of:
  - Subcommittee for Ozone, Particulate Matter and Regional Haze Implementation Programs (Ozone FACA)
  - OTAG
  - OAR's Section 812 sector studies

Issue:
Sulfur Impact on Emissions

- Assess impact of the sulfur level of in-use fuels on the emission performance of Tier 2 technology

- ★ **What is the impact of sulfur on emissions for Tier 2/NLEV technology?**
- ★ **What are the options, and what is the cost, for reducing sulfur to different levels?**
- ★ **What are the prospects for sulfur-resistant catalyst technology ?**

Workshop Wrap-up

- Workshop is just the beginning of the Tier 2 Study

- EPA is looking for opportunities to work with interested parties

- For more info and updates use Tier 2 Study Internet site: http://www.epa.gov/OMSWWW/tr2home.htm